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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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11/10/2003

Anand Anandakumar

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EXAMINER

CHAUDRY, MUJTABA M

ART UNIT

PAPER NUMBER

2112

MAIL DATE

DELIVERY MODE

08/13/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/705,597	Applicant(s) ANANDAKUMAR, ANAND	
	Examiner M. MUJTABA K. CHAUDRY	Art Unit 2112	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 November 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Applicant's response was received November 21, 2007.

- Claim 1-5 are rejected under 35 USC 103.
- Claims 1-5 are rejected under 35 USC 112.
- Claims 1-5 stand rejected.

Application is pending.

Response to Amendment

Applicant's arguments/amendments with respect to claims 1-5 filed November 21, 2007 have been received. All arguments have been fully considered. The Examiner would like to point out that this action is made final (See MPEP 706.07b [R-6]).

It is assumed that the Applicant contends the prior art does not teach *modulo arithmetic and log domain is used to avoid scaling and normalization*. The Examiner respectfully disagrees. The Examiner would like to point out that according to the specification in log domain the multiplication operations change to additions and division to subtraction. Zeng clearly teaches (i.e., Figure 4) to perform addition and subtraction operations in decoding the data, which implies that the operation is in "log domain". However, it is not clear from the claim what *small numbers* are referred to.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- The claim recites *said modulo operations performed in a log domain to reduce a need for additional operations to scale and normalize data during successive backward and forward recursions of small number*. It is not clear what small numbers are since they are not defined.

Claims 2-5 do not rectify the matter of claim 1 and inherently include the limitations of claim 1 and therefore are rejected as well. Appropriate correction is requested.

Claim Rejections - 35 USC § 103

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyauchi et al. (herein after: Miyauchi, USPPN 2003/0106011) further in view of Zeng et al. (herein after: Zeng, “Design and Implementation of A Turbo Decoder for 3G W-CDMA System”, Published March 11, 2002—Cited in Applicant’s IDS). (Previously present rejection):

As per claim 1, Miyauchi substantially teaches a decoder for a communication system (i.e., Figure 1), the decoder comprising: a first decoder block (i.e., Figure 9, reference number 34 and paragraph 0280-0281) that receives a soft-input information bit for decoding and calculates a probability estimate for the soft-input information bit; a second decoder block (i.e., Figure 9, reference number 36 and paragraph 0280-0284) configured to receive and process the probability estimate of the soft-input information bit; and a decision module adapted to receive the processed soft-input information and to generate hard-decision output information (i.e., paragraph 0909).

Miyauchi:

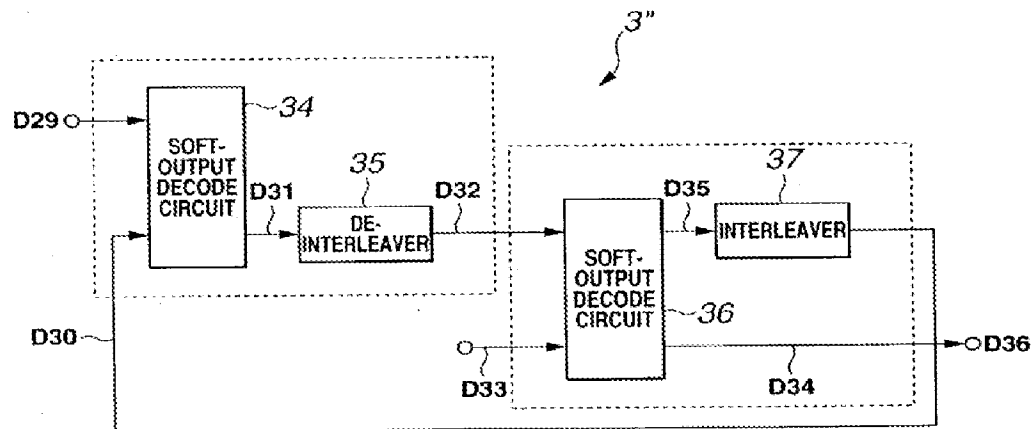


FIG.9

Miyauchi does not explicitly teach to perform modulo arithmetic operations as stated in the present application.

However, Zeng teaches, in an analogous art, (abstract) the design and implementation of log-MAP turbo decoder used in 3G mobile communication W-CDMA

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systems. The decoding algorithm is highly data dominated and needs many memories for data storing. Particularly, Zeng teaches (i.e., Figure 1 and Page 285) to use perform branch metric calculations for each of the iterations in the second decoder (Reference 107, Figure 1). The Examiner would like to point out that branch metric calculations inherently require modulo arithmetic operations. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to allow the second decoder of Miyauchi to perform branch metric calculations with arithmetic operations as suggested by Zeng. This modification would have been obvious to one of ordinary skill in the art because one of ordinary skill in the art would have recognized that by performing branch metric calculations in the second decoder would have improved the decoding by reducing the overall memory requirements in the decoding process as indicated by Zeng (abstract).

As per claim 2, Miyauchi substantially teaches, in view of above rejections, (i.e., Figure 9 and Paragraph 0281) the first decoder block includes an output element configured to receive the soft-input information bit and to generate extrinsic information.

As per claim 3, Zeng substantially teaches, in view of above rejections, (i.e., Figure 1) an interleaver configured to interleave the received output extrinsic information, and to direct the interleaved output to the second decoder block.

As per claim 4, Zeng substantially teaches, in view of above rejections, (i.e., Figure 1 and Page 285) the second decoder block includes a state metric calculator configured to calculate backward and forward metric using the soft-input information bit and extrinsic information.

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As per claim 5, Zeng substantially teaches, in view of above rejections, (i.e., Figure 1) a de-interleaver configured to de-interleave the output of the second decoder block, and to feed the de-interleaved output back to the first decoder block.

Conclusion

This is a continuation examination of applicant's earlier Application No. 10705597. All claims are drawn to the same invention claimed in the earlier application and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the earlier application. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action in this case. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no, however, event will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiries concerning this communication should be directed to the examiner, Mujtaba Chaudry who may be reached at 571-272-3817. The examiner may normally be reached Mon – Thur 6:30 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jacques Louis-Jacques can be reached on 571-272-6962.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Mujtaba K Chaudry/
Examiner, Art Unit 2112